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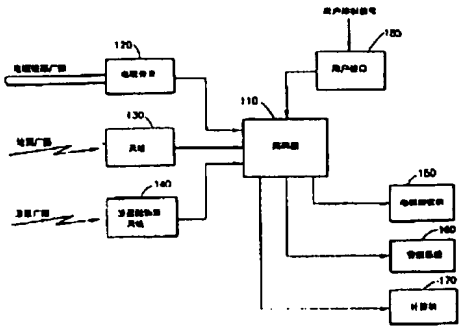
[54]发明名称 电视频道分组导引

[57]摘要

一个电视观众通过按动手持遥控器上的“频道增加”或“频道减少”键，可以很容易地导引到按照公共业务提供者或其它分组规则而分组的节目。由一个或多个传输途径传输来的节目播放业务被综合起来，从而允许观众连续地选择那些已被分组的频道，而不考虑广播信号，传输途径、频谱，传输流和/或携带频道信息的 PID。



权　利　要　求　书

1、一种用于对在相应的频道中提供的许多广播节目播放业务进行分组的方法，包括以下步骤:

按照一个希望的第一分组规则把所述频道中的第一多个频道分组成一个第一频道组;

所述第一频道组包括一个初始频道，以及至少一个次级频道;

其中:

一个用户根据一个用户控制信号可以顺序地选择对应于所述第一频道组的节目播放业务。

2、如权利要求 1 的方法，其中:

所述初始频道是与在一个初始广播信号中携载的一个节目播放业务相联系的。

所述至少一个次级频道是与在至少一个次级广播信号中携载的一个节目播放业务相联系的，并且

所述初始和次级广播信号是由各自不同的传输途径提供的。

3、如权利要求 2 的方法，其中:

途径选择数据具有所述广播节目播放业务用于识别它的传输途径。

4、如上述权利要求之一的方法，其中:

所述初始频道携载其相关的作为一模拟信号的节目播放业务，并且所述至少一个次级频道携载其相关的作为一数字信号的节目播放业务。

5、如权利要求 1 至 3 其中之一的方法，其中:

所述初始频道携载其相关的作为一数字信号的节目播放业务，并且所述至少一个次级频道携载其相关的作为一数字信号的节目播放业务。

6、如上述权利要求之一的方法，还包括步骤:

提供一个虚拟频道记录，它将所述初始频道和所述至少一个次级频道的一个广播地址联系起来。

7、如权利要求 6 的方法，其中:

所述初始频道是一个当前选中的频道；和

所述用户控制信号是一个频道增加命令;

所述方法还包括以下步骤:

响应所述频道增加命令，利用所述虚拟频道记录来选择至少一个次级频道的一个广播地址；和

对选中的次级频道节目播放业务进行处理从而传输给用户;

因而允许该用户顺序地选择所述初始频道和所述选中的次级频道而不会选择那些不是所述第一频道组中一部分的频道。

8、如权利要求 7 的方法，其中;

响应所述频道增加命令，该用户能够顺序地选择所述初始频道和全部该第一频道组的次级频道，而不会选择那些不是所述第一频道组的一部分的频道。

9、如权利要求 6 的方法，其中:

一个目前选中的频道是该第一频道组的那些次级频道之一；和

所述用户控制信号是一个频道降低的命令;

所述方法还包括步骤:

响应所述频道降低的命令，利用所述虚拟频道记录来选择所述初始频道的一个广播地址；和

对所述初始频道节目播放业进行处理从而传输给用户;

因而允许该用户顺序地选择所述选中的次级频道和所述初始频道，而不会选择那些不是所述第一频道组的一部分的频道。

10、如权利要求 9 的方法，其中:

响应所述频道降低命令，该用户能够顺序地选择第一频道组的全部次级频道和所述初始频道，而不会选择那些不是所述第一频道组的一部分的频道。

11、如上述权利要求之一的方法，还包括步骤:

根据一个希望的第二分组规则，把所述频道中的第二个多个频道分组成一个第二频道组;

所述第二频道组包括一个初始频道，以及至少一个次级频道；其中:

所述第二频道组的所述频道和所述第一频道组的所述频道并不完全相同；和

根据一个用户控制信号，一个用户能够顺序地选择对应于所述第二频

道组的节目播放业务。

12、如前述权利要求之一的方法，其中

根据所述广播节目播放业务携带的数据，确定所述第一分组规则。

13、一种解码器，用来对由相应的频道提供的多个广播节目播放业务进行分组，包括:

分组装置；根据一个希望的第一分组规则，把所述频道中的第一个多个频道分组成一个第一频道组;

所述第一频道组包括一个初始频道和至少一个次级频道；和

一种用户接口，用来根据一个用户控制信号，允许一个用户顺序地选择对应于所述第一频道组的节目播放业务。

14、如权利要求 13 的解码器，其中:

所述初始频道是和在一个初始广播信号中携载的一个节目播放业务有关的;

所述至少一个次级频道是和在至少一个次级广播信号中携载的一个节目播放业务有关的；和

所述初始和次级广播信号是通过各自不同的传输途径提供的。

15、如权利要求 14 的解码器，其中;

途径选择数据具有所述广播节目播放业务用于识别它的传输途径。

16、如权利要求 13 至 15 之一的解码器，其中:

所述初始频道携载其相关的作为一模拟信号的节目播放业务，并且所述至少一个次级频道携载其相关的作为一数字信号的节目播放业务。

17、如权利要求 13 至 15 之一的解码器，其中:

所述初始频道携载其相关的作为一数字信号的节目播放业务，并且所述至少一个次级频道携载其相关的作为一数字信号的节目播放业务。

18、如权利要求 13 至 17 之一的解码器，还包括:

一种存贮器，用于存贮一个虚拟频道记录，它将所述初始频道和所述至少一个次级频道的一个广播地址相联系。

19、如权利要求 18 的解码器，其中:

所述初始频道是一个当前选中的频道；和

所述用户控制信号是一个频道增加命令;

所述解码器还包括:

选择装置，响应所述频道增加命令，利用所述虚拟频道记录来选择至少一个次级频道的一个广播地址；和

一处理器，响应所述选择装置从而用于处理该选中的次级频道节目播放业务并传输给用户;

因而允许用户顺序地选择所述初始频道和该选中的次级频道，而不会选择那些不是所述第一频道组中的一部分的频道。

20、如权利要求 19 的解码器，其中:

所述选择装置响应所述频道增加命令用于允许该用户顺序地选择所述初始频道和所有该第一频道组的次级频道，而不会选择那些不是所述第一频道组中的一部分的频道。

21、如权利要求 18 的解码器，其中:

次级频道之一是一个当前选中的频道；和

所述用户控制信号是一个频道降低命令;

所述解码器还包括:

选择装置，响应所述频道降低命令，使用所述虚拟频道记录来选择所述初始频道的一个广播地址；和

一处理器，响应所述选择装置用于处理所述初始频道节目播放业务从而传输给用户;

因而允许用户顺序地选择所述选中的次级频道和所述初始频道，而不会选择那些不是第一频道组中的一部分的频道。

22、如权利要求 21 的解码器，其中:

所述选择装置响应所述频道降低命令用于允许用户顺序地选择所述第一频道组的全部次级频道和所述初始频道，而不会选择那些不是第一频道组中的一部分的频道。

23、如权利要求 13 至 22 之一的解码器，还包括:

用于根据一个希望的第二分组规则，把所述频道中的第二个多个频道分组成一个第二频道组的装置;

所述第二频道组包括一个初始频道和至少一个次级频道;

一种用户接口，用于根据一个用户控制命令允许一个用户顺序地选择

对应于所述第二频道组的节目播放业务;

所述第二频道组的所述频道与所述第一频道组的所述频道是不完全相同的。

24、如权利要求13至23之一的解码器，其中:

根据广播节目播放业务携带的数据来确定所述第一分组规则。

25、如权利要求1至12之一的方法，还包括步骤:

提供用于所述初始频道和至少一个所述次级频道的各自多部分的频道标识符，所述标识符包括一个第一部分，它用来标识在所述第一频道组中所述初始频道和至少一个所述次级频道，它还包括一个第二部分，用来把所述初始频道与至少一个所述次级频道彼此区别开来。

26、如权利要求13至24之一的解码器，其中:

所述用户接口提供各自多部分的频道标识符用于所述初始频道和至少一个所述次级频道，所述标识符包括一个第一部分，用来标识在所述第一频道组中所述初始频道和至少一个所述次级频道，它还包括一个第二部分，用来把所述初始频道和至少一个所述次级频道彼此区别开来。

说　明　书

电视频道分组导引

本发明涉及一种根据一种分组规则将多个电视频道进行分组的装置和方法。本发明特别适用于对那些由一个公共节目播放服务提供者例如电视网络，提供的频道进行分组，并且还可以对经不同传输途径中的不同的广播信号提供的节目播放服务进行综合。

最近，由于应用了数字电视传输方案，例如MPEG-2和Digicipher^{R} II，使得可用的电视频道的数量已有了一个快速的增长。一个数字电视信号能被压缩到使之适合比常规的模拟信号的频谱更窄的频谱。事实上，利用这些推荐的方案，多达10个或更多的标准清晰度(SDTV)电视频道或者2个高清晰度(HDTV)电视频道能适合6MHZ的带宽，而这通常只能携载一个模拟电视频道．因此，提出一种混合通信方案是非常有意义的，即一些频道分配被用于传输数字电视信号，同时，余下的分配携载模拟电视信号。这种混合方案通过在传送一个或多个新的数字频道的同时，允许广播电台继续发送常规的模拟电视频道而为全数字系统提供了一个过渡期。

目前，美国的地面广播电视的频率分配范围是54MHz至806MHz，每个频道带宽为6MHz。按照政府规定，即美国联邦通信委员会(FCC)的规定，这些频道依次地编号为2至69。例如，频道2对应的是54～60MHz频带，频道3对应的是60～66MHz频带。但是，随着电视频道和可获得的节目播放的大量增加，为满足观众和节目播放服务提供商的要求，有必要对节目进行规划。而且，即使是当一个业务提供商在不同的频道上提供不同的节目播放选择的时候，节目播放业务提供商希望保持一个很稳定的商标(例如，关于他们已得到的广播频道号)，例如，节目播放业务提供商HomeBoxOffice^{R} (HBO)拥有一些不同的频道，分别由标态HBO，HBO-2，HBO-3等等来标识。此外，国家和地区的节目播放业务提供商希望与当地的联播台保持一个很紧密的联系，这样可以提供当地的新闻，体育，电影等节目播放业务。例如，一个国家级网络广播台，象国家广播公司(NBC)就拥有许多地方联播台。许多地方联播台在对应于分配给他们的频带的频

道号上，具有它们希望保持和建立的一个稳定的商标(例如， 2 频道新闻)。

同样的，观众也希望有一个简单易懂的方式从能得到的节目播放的服务中来选择，即使当频道增加或取消的时候，或者对现有的节目播放业务的频道的分配进行重新安排时。尤其是，如果观众能够通过操作手持遥控器等上的“频道增加”和“频道减少”键就可以对由一个公共服务提供商提供的频道进行选择，那将是非常方便的。

现存的电视系统，通常不能用频道增加或频道减少功能很容易地访问那些与一公共节目播送提供商相关联的频道，这是因为那些相关联的频道通常是不相邻的。例如，频道 2 和频道 20 是相关联的，观众必须按频道增加键并且连续按 18 次，才能从频道 2 移到频道 20 . 这样很浪费时间而且不方便。而且，虽然观众可以选择通过直接利用遥控器上的数字键盘得到想要的频道这种方式，但是这需要观众知道分组频道的频道号。此外，节目播放业务提供商可能会失去观众，因为如果该观众依次选择频道时，他可能会偶然发现有的频道比他原想选择的由该节目播放供应商提供的节目更有趣。当然，该节目播放供应商为了建立有益的广告率，对维持与观众的联系很感兴趣。

分组的电视节目可以是从不同传输途径由不同的广播信号提供的。例如，一个电视节目比如一个全国范围网络新闻节目可以由一个直接广播卫星系统(DBS)传输，经观众自家的卫星抛物面天线进行接收。不过，观众不能够收看到由一个地面广播信号提供的一个地方联播台的节目，除非他切换掉DBS 系统开关而由一个常规的兔耳形天线或类似的装置接收并调谐到该地方联播台的节目。此外，附加的相关节目也可能仅仅是由另外的传输途径例如一个电缆电视(CATV)分配系统提供的。另外，利用其他的广播方案例如多点微波分配系统(MMDS)，可以看到，可用的选择可以很快地覆盖许多观众。

因此，希望能够提供这样一个系统，即允许观众使用一个手持遥控器或类似的装置上的“频道增加”或“频道减少”键就可以容易地导引到节目，这些节目是依照一个公用业务供应商或其他分组规则而进行分组的。而且，还希望能够提供一种可对来自一个或更多传输途径的节目播放业务进行综合的系统。该系统允许观众依次选择那些分组的频道，而不用考虑

广播信号，传输途径和/或携载频道的频谱。该系统还应该允许用一个公共频道标志符例如一个频道号对这些分组频道进行标识。本发明提供一个具有上述和其它优点的系统。

依照本发明现提供这样的一种装置和方法，即允许观众使用一个手持遥控器或类似的装置上的“频道增加”或“频道减少”键，可以容易地导引到节目，这些节目是依照一个公用业务供应商或其他分组规则而进行分组的。该系统对来自一个或更多传输途径的节目播放业务进行综合，从而允许观众依次选择那些分组的频道，而不用考虑广播信号，传输途径，频率，传输流和/或携载该频道的 P1D 。另外，该系统允许用一个公共频道标志符，例如频道号对这些分组频道进行标识。

一种用于对在相应的频道中提供的许多广播节目播放业务进行分组的方法中，依照一个所希望的第一分组规则，例如一个公共节目播放业务提供商，将多个频道的节目分组到第一频道组。并非所有频道都需要是一组里的成员。事实上，希望既存在一些非分组的，独立的频道，也存在一些依照本发明进行分组的频道。在第一频道组中，虽然可能会出现一组仅有一个频道的现象，但通常要确定一个初始频道和至少一个次级频道。该初始频道节目播放业务占有一个相应的“广播地址”，它可以定义一个频道用于一模拟信号，也可以定义一个传输流用于一数字信号，该传输流包括 P1D 信息和提供传输流的传输频率。同样，该次级频道节目播放业务也占有一个相应的广播地址。观众可以根据用户控制信号来依次选择第一频道组的节目播送业务，该用户控制信号是例如自手持遥控器发出的“频道增加”或“频道减少”指令。

该初始频道节目播放业务可以由一种初始广播信号携载，而该次级频道节目播放业务可以由一种次级广播信号传输，该初始的和次级广播信号可以分别由不同的传输途径传输。这些传输途径可以包括例如直接广播卫星途径，电缆分配途径，地面广播途径和多点微波分配途径。此外，为了识别传输途径，可以把途径选择数据加到该广播节目播放业务中。

在一个具体的实施例中，该初始频道节目播放业务是作为一模拟信号被携载的，并且次级频道节目播放业务是以一种或更多的分包复合的数字信号被携载的。 P1D 数据是用来从一种分包复合的数字传输流中区别出这

些节目播放业务的。或者，初始和次级频道节目播放业务都是作为数字信号被携载的，也可能，初始频道节目播放业务是数字的而次级频道节目播放业务全部或者部分是模拟的。

提供一个“虚拟频道”记录并局部存储起来(例如，在解码器中)，该记录将初始频道和其中次级频道被以相应的广播信号所携载的广播地址联系起来。一个“虚拟频道图”包括许多虚拟频道记录。该虚拟频道图可以通过观众提供的一个频道增加或频道减少信号而被移过。

当用户发出一个频道增加命令(例如，频道增加)并且当前的频道是该组的初始频道时，次级频道的节目播放业务将会被依次处理(例如，一个接一个)通过例如电视屏幕和音频扬声器传输给观众，该处理过程与广播信号或其中携载该次级频道节目业务的广播信号内的位置无关。同样，当用户的控制信号是一个频道降低命令(例如，频道减少)并且当前的频道是次级频道时，那么在回到或者初级频道，或者跟在该初级频道之前或之后的下一个非分组频道之前，较低的次级频道，如果有的话，将被依次选择。因而，用户可以依次观看初始频道和那些次级频道而跳过(例如，越过)那些中间的非分组的频道。

另外，可以提供任何数量的频道组(例如，电影组，体育组等等)，而且这些组可以包括公用频道。甚至还可以有频道组的分组，依此类推。分组规则通常是依照随节目播放业务一起传输的数据或者经一个另外途径例如由一个智能卡或者电话线提供给一个解码器的数据来确定的。

并且还提供一个相关的解码器。

附图 1 是依照本发明的一种通讯系统的框图。

附图 2 是依照本发明的一个解码器的框图。

依照本发明现提供这样一种装置和方法，即允许观众使用一个手持遥控器或类似的装置上的“频道增加”或“频道减少”键，可以容易地导引到电视节目，这些节目是依照一个公共业务供应商或其他分组规则而进行分组的。从而允许观众依次选择那些分组了的频道，而不用考虑广播信号，传输途径和/或携载该频道的广播地址。

下表 1 表示了目前可能存在的一种常规频道的分组情况。第 1 栏是“虚拟频道标示符”，仅是一种指定的频道号。因为该标示符是被随机指定的，

所以它是虚拟的。第 2 栏表示的是“节目播放业务供应商”，它可以是电视台或其它节目来源的字母缩写。第三栏表示相关频道的位置。这里，虚拟频道标示符 200 ~ 202 分别对应于节目播放业务供应商的字母缩写 HBO 、 HBO-2 和 HBO-3 。这样，对于常规的方案来说，最好的结果是将相关联的频道赋值以顺序的频道号。

表 1

虚拟频道标示符	节目播放业务供应商	说明
1	WGN	
2	KTLA	
...		
8	KCST	
9	KUSI	
10	KGTV	
11	KPBS	
...		
199	Weather	
200 201 202	HBO HBO-2 HBO-3	具有相邻的频道号的相关频道
203	CMX	

下面表 2 表示的是依照本发明的一个频道组。在这个例子中，一个第一频道组(例如， ABC 组)包括频道 10 和 111-113 。另外，频道 10 定义为“初始频道”，频道 111-113 定义为该组的“次级频道”。该初始频道代表了一个初始点，从该点开始经过许多连续的“频道增加”步骤即可游览该组的所有频道。

表 2

虚拟频道标示符	节目播放业务供应商	说明
1	WGN	
2	KTLA	
...		
8	KCST	
9	KUSI	
10	KGTV	ABC 组，初始频道
11	KPBS	
...		
110	WH1	
111 112 113	ABC-1 ABC-2 ABC-3	ABC 组， 次级频道
...		
199	Weather	

一个为本发明的频道分组的观点而提供的解码器，它允许观众很容易地在一组中的频道间移动(即，导视)。例如，假设当前选定的频道为频道 8，那么，当观众按动其手持遥控器或类似装置上的“频道上升”(例如，频道增加)或相类似的按键时，将会按下列顺序依次选择虚拟频道： 9， 10， 111， 112， 113， 11 ....。这样，由于那些中间频道 11 至 110 被绕过了，因此，从频道 10 有一个“跳跃”直到频道 111 。并且由于那些中间频道 112 至 12 被绕过了，因此从频道 113 有一个“跳跃”直接到 11 频道。请注意当目前频道是一个初始频道(例如： 10 频道)并且观众做出一个频道上升的命令时，将要显示的下一个频道是和该初始频道同组的次组频道中的一个(例如， 111 频道)。此外，观众可以直接切换到其它的次级频道，直至接收最后一个次级频道(例如， 113 频道)。这样，观众可以顺序地看到 ABC 组的那些频道，而不用看非分组的中间频道。

当接收的频道是一组中的最后一个次级频道而观众又发出了另一个频

道增加的命令时，将会退出这个组而选到下一个跟在本组初始频道之后的虚拟频道(例如， 11 频道)。观众可以按常规方式在非分组的频道中切换，例如，顺序地从 11 频道到 12 、 13 等等。

如果当前选择的频道在一组中，并且观众发出了一个“频道下降”(例如，降低频道)命令时，观众将按反方向顺序地在该组的次级频道间切换，然后跳到下一个跟在该组初始频道后的比它的频道号高的非分组频道上。举个例子，如果当前选择的是 113 频道，那么顺序是 112 ， 111 ， 11 。或者顺序是回到该组的初始频道，例如，顺序是 112 ， 111 ， 10 ，然后是刚好位于该组的初始频道前面的频道，例如， 9 频道。换句话说，当目前选择的是一组中的任一次级频道并且发出一个降低频道的命令的时候，即使存在该组的次级频道的中间频道，也有可能会出现选择的频道是该组的初始频道的情况，例如，顺序是 113 ， 10 。此外，尽管可能有各种各样的方式，在一组中导引的最好方式是，将导引一组的顺序从按频道降低方向改为按频道增加的方向。对于大多数观众来说，该方式被认为是最通用并且容易操作的。

另外，除了频道上升或频道下降以外的其他命令可以用来形成一个特殊的导引顺序。例如，遥控器或其它类似接口设备上的“返回”键或类似的功能键，可以用来马上选择一个目前显示组的一个初始频道或者其它的标记频道。另外，一个观众可以选择一个特殊命令方式。例如，第一种方式，当目前频道是一个次级频道时，频道下降命令可以用来马上选择出初始频道。第二种方式，如果存在次级频道的中间频道的话，频道下降命令可以用来在返回初始频道之前，选择出中间的次级频道。第三种方式、频道下降命令将选择中间的次级频道，如有的话，并继续选择与次级频道相邻的非分组频道，而不会返回到初级频道。第三种方式，例如顺序是 10 ， 111 ， 110 ， 109 等等。

在表 2 所示的例子中，这些频道组是依据一个公共节目播放业务提供者、赞助商或者其它财团进行定义的。然而，这些频道组也可以依照各种规则来确定，诸如，一个播送节目的主题(例如，体育，优秀电影，网络，综合节目，儿童节目、新闻、教育节目等等)，一个流行性因素(例如，排在耐勒松化率或全美家庭收视率前十位的节目)、人口统计因素(例如，为拥有

幼儿家庭为服务对象编排的节目)、地理或者任何其它实际存在的因素。

另外，分组概念可以扩展为一个组内的频道可以被两个或两个以上的中间频道组(例如，未分组频道)所间隔。例如，两个次级频道可以被一个或更多的未分组频道所间隔。另外，还存在包括两个或两个以上的频道组的组。例如，一个观众可能希望依次收看属于一个体育组的那些频道，然后收看属于一个电影组的有关频道，诸如此类。

另外，在一些情况下，在一组中可以提供来自对应于不同时域一个国内网络上的节目的几个不同的实例。例如，一个组可以包括在相同网络中的东海岸节目，山区州节目和两海岸节目。这样，一个观众可以顺序收看在同一频道但属于不同时域的节目。

此外，这些按序列方式排列的还可以依照该节目播放业务的传输的数据来确定，通过一个单独的传输途径诸如一个电话线传输或者局部存储在诸如一个智能卡或者用户输入端。

与导引方式和排序方式无关，每个频道都有一个不同的虚拟频道号，例如，在 1 ~ 999 范围中。这样观众可以利用遥控器上的数字键输入数字从而直接访问频道。另外，观众还可以使用一个图像用户接口来选取频道。这样，人们就会明白，观众频道选择器方式并不局限在利用手持遥控器还可以利用任何有效的装置来选择一个频道，包括指示器诸如一个鼠标，或一个键盘，一个触摸屏，语言识别系统等等诸如此类。

图 1 是依照本发明的一个通讯系统的框图。图 1 示出本发明的频道组如何被综合入一个解码器系统中，其中模拟信号和数字信号均在一个或更多可以在不同的传输途径（例如，地面，DBS，CATV，MMDS)中携载的传输信号的相应频带中被携载。这里示出三个可能的不同的传输途径。在观众家附近的一个电缆分支 120 点接收一个电缆线路广播信号。电缆广播信号可以包括模拟和/或数字信号，但在本发明的例子中，假设仅包括模拟信号。在观众家附近的一个天线 130 点接收一个地面广播信号，该信号以混合方式可以是在相应频带上的数字信号和模拟信号。最后，在观众家附近的一个卫星抛物面天线 140 点接收一个诸如在一个 DBC 系统中的卫星广播的数字信号。

每个接收到的信号都送到一个解码器 110 进行处理。该解码器也接收

来自一个用户接口 185 的输入信号，该接口响应一个用户控制信号，该信号可以是来自前面讨论的遥控器发出的频道上升或频道下降命令信号。该解码器 110 对一个或多个广播信号进行处理从而提供以一个视频信号形式的被请求输出的信号给电视接收机 150，一个音频信号给一个音频系统 160 诸如一个家庭影院高保真系统，或者一个数字信号给一个计算机 170 。例如，当家用设备，保安，火警系统或者其它与该解码器相配合工作时，也可以提供其它的输出信号。

图 2 示出有关本发明的一个解码器框图。尽管该解码器 110 可以处理三种或更多的不同的广播信号，但在一个给定时间内可以需要仅处理其中一个信号。另外，当仅提供一个广播信号的时候，该解码器是可操作的。该解码器 110 经端子 205 接收电缆广播信号并将它传给一个电缆调谐器/解调器 230 ，在这里可以提取出要选择的节目播放业务信号。该提取出的节目播放业务信号由一个模拟信号处理装置 260 处理。该模拟信号处理装置 260 给一个输出接口 270 提供相应的视频，音频和/或数字信号，其中这些信号输出给相应的设备。

一个端子 210 接收一个地面广播信号，在这例子中该信号包括模拟信号和数字信号，并且该信号经该端子传给一个地面调谐器/解调器 240 。该地面调谐器/解调器 240 提取一个选好的节目制业务并且确定它是数字信号还是模拟信号。如果提取出的信号是模拟信号则传给模拟处理器 260 。应该明白，即虽然该模拟处理器 260 被示为处理来自电缆广播和地面广播的模拟信号，但并不表明对每个模拟信号的处理是相同的。根据各个广播信号必须形成不同的模拟传输方式和传输规程。另外还需注意的是，在广播中还存在数字和/或模拟的任何组合信号.

如果从该地面调谐器/解调器 240 中提取出是数字信号，则该信号被传送给数字处理器 265 ，在这里，对视频、音频和/或数据处理进行处理来恢复相关的信息。该数字处理器 265 接收来自中央处理器（ CPU ） 275 的用于识别 PIDS 信号的广播地址信息，被选出的节目播放业务信号搭载在数字信号中。一般的，为了在一个分配频谱中提供的一个数字传输流中进行传输，含有多达 10 个或更多的数字节目播放业务的数据包将被分组和复用。该装置 265 处理合适的数据包来提供选中的节目播放业务给输出接口

270。

一个端子215接收一个诸如来自一个DBS系统的一个数字卫星广播信号并且传输该信号给一个卫星调谐装置/解调器250。该调谐器/解调器250依照来自该CPU 275的广播地址信息提取出该已选的节目播放业务并且将它供给数字处理器265。应该明白的是，尽管该数字处理器265如图所示为处理来自地面广播和卫星广播的两种数字信号，但是数字信号的处理过程可以是不同的。

该CPU 275可以接收来自该模拟处理器260和/或来自该数字处理器265的表明该信号的传输途径，和/或提供频道分组信息（例如，一个虚拟的频道图或记录）的信号。对于模拟信号，该频道分组信息可以放在诸如垂直消隐期间（VBI）。对于数字信号，该频道分组信号可以在传输流中提供的一个虚拟频道图中被携载。该CPU 275还接收一个来自用户接口165，响应用户控制信号的表示一个选择频道的用户命令。例如，当用户使用一个手持红外发送器发出一个控制信号时，该用户接口165将包括一个红外接收装置。一个协助该CPU 275存贮传输途径和频道分组数据的存贮器280，它还可以保存一种用户控制信号的记录和其它相关的信息。该CPU还提供一个包括广播地址信息（例如，频率和/或PID）给该调谐器/解调器230、240和/或250，它们用来表明选择出的频道从而提取出合适的数据。

请注意，在图2中还可以需要许多常规的处理步骤，诸如去复用，分析，解密和诸如此类的步骤，但并没有特意在图中表示。这些步骤在现有技术中是众所周知的。

在图2的解码器110的一个第一实施例中，假设该解码器（例如，在端子210处）接收模拟和数字的地面广播信号。这样，仅仅需要提供一个广播信号调谐器/解调器（例如，装置240）。在这种情况下，并不需要提供其它的广播信号调谐器/解调器（例如，装置230和装置250）。例如，参照表2，10频道是一个ABC的地方联播台，是一个国家级节目播放业务供应商，并且它在192～198MHz波段通过地面广播方式来传输一个电视信号。再假设存在一种混合地面广播方式是可用的，即在未使用的波段或模拟信号波形的部分诸如，VBI中携载数字信号。例如，ABC可以传输在一个6MHZ宽的波段上携载的分包复用的数字信号中具有ABC-1、

ABC-2 和 ABC-3 标号的频道的节目播放业务。另外，在该地方联播台的范围里， 506-512M HZ 的波段可以是不使用的，该波段已经被 FCC 标记为 20 频道了。此外，在各自波段上，每个 ABC-1， ABC-2 和 ABC-3 频道信号。可以传输各自的分包复用的数字信号。

为了市场需要，国家级节目播放业务供应商可能希望用原来的本地模拟频道来标识的 3 种数字频道 ABC-1 、 ABC-2 和 ABC-3 ， 模拟频道 10 。本发明使得该愿想成为可能而不用考虑传输流和/或传输该 3 种数字信号的 PIDS 。特别是，可以在诸如 VBI 中传输带有模拟频道 10 信号的数据，它将 10 频道标识为该 ABC 组的一个初始频道。同样的，提供数据给 ABC-1 ，ABC-2 和 ABC-3 频道，它将这些频道标识为该 ABC 频道组的次级频道。另外，该频道组信息可以在一个未使用的频道分配或由任何其它的可行方式搭载在该模拟 10 频道信号上。

假设一个用户提供一个控制信号来选择 10 频道。该 CPU 将提供给地面调谐器/解调器 240 相关的广播地址信息从而在波段 192 ~ 198M HZ 上恢复模拟信号。然后，模拟处理装置 260 将该模拟信号进行处理成一种合适的形式从而在一个电视机上显示. 现在假设一个用户希望顺序地观看该 ABC 组中的次级频道。依照本发明，该用户可以提供一个频道上升控制信号给用户接口 165 。 CPU 275 将会从该用户接口 165 中接收一个相关的控制信号并且访问存贮在存贮器 280 中的数据从而确认关于该组的第一个次级频道（即 ABC-1 频道）的广播地址信息（例如，频率， PID 和/或其它所需的参数）。

在这个例子中，通过端子 210 只接收一种广播信号，即地面广播信号，它提供了其中携载 ABC-1 的相应 PID 和频谱. 该 CPU 提供适当的广播地址信息给地面调谐器/解调器 240 和数字处理装置 260 ，以提取在波段 506 ~ 512M HZ 的数字数据. 如上述当在一种公用传输流中，诸如以一种分组复用方式来提供来自两个或更多数字频道的数据的时候，该存贮器提供的广播地址信息就包括了一种 PID 或者用来从其它种节目播放业务中区分出一种节目播放业务的其它信息。

合适的数字数据将被提取出来并且供应给数字处理装置 265 。然后，一种适合在电视机上显示的相应的信号将提供给输出接口 270 。这样，观

众只需简单地发出一个频道上升的命令，即可立即从 192 ~ 198M HZ 波段的 10 频道切换到在 506 ~ 512M HZ 波段上的 ABC-1 频道。从而绕过了那些在 198 ~ 506M HZ 波段上的中间频道以及可能由在 506 ~ 512M HZ 波段上的传输流中携载那些非分组的频道。此外，如果该观众在选择 ABC-1 频道后继续发出一个频道增加的命令，那么他可以直接切换到在 506 ~ 512M HZ 上的传输流中的 ABC-2 、 ABC-3 频道，然后切换到在 198-204M HZ 波段上的 11 频道。

请注意，那些 ABC-1 ， ABC-2 和 ABC-3 频道已经用他们称谓字母而非一种数字的频道标示符来表示了。为了在观众的心目中增加这种印象，即那些特殊的频道是一个公用业务提供者的频道组的一部分，例如，也许会希望用与初始频道相同的标示符或者是它的一种变形来表示它的次级频道。例如，也许会希望在解码器或者电视机上提供一种显示，例如，可以通知观众分别用以下这些符号对 ABC-1 ， ABC-2 和 ABC-3 的频道进行标示，即: 10.1 、 10.2 和 10.3 ; 10-A 、 10-B 和 10-C 诸如此类。利用这种方式来提醒观众，即这些 ABC-1 、 ABC-2 和 ABC-3 频道是与 10 频道有关的，该 10 频道是观众所熟知的地方联播台。该次级频道也许会被认为是在该家用 10 频道 “的里面广播的” 或者在广播信号中正好排在 10 频道的后面。

此外，即使 10 频道（例如，地方联播台 KGTV ）转移到一个不同的频谱、传输流和/或 PID ，或者作为一种模拟信号或者作为一种数字信号，电视台的 10 频道组或者 “家族” 仍然可以保留。特别是，该 KGTV 信号可以分配给一个虚拟的 10 频道从而在观众方面保持它的连续一致。该标示符 “ 10 ” 是 “虚拟” 的，因为并不需要它与 FCC 频道标示符方式或者任何特殊频谱式 PID 位置保持一致。

在图 2 所示解码器 110 的第二实施例中，假设该解码器 110 接收来自三种不同传输途径的三种广播信号，即一种包含模拟频道的电缆广播; 一种包含模拟频道和数字频道的混合地面广播; 一种包含数字频道的卫星广播。根据观众的控制信号来选择出一个所需的频道。 CPU 275 对存贮器 280 进行访问从而确定对应所选的频道的相应广播地址信息。相应的调谐器解调器例如调谐器/解调器 230 、 240 或者 250 , 它和用于数字信号的装置 265

或者用于模拟信号的装置 260 一起提取出所希望的信号。

举个例子，假设当前选中的频道是初始频道，它是由调谐器/解调器 240 处理的在地面广播信号中的一个模拟频道，第一次级频道是地面广播中的一个数字频道，第二次级频道是卫星广播的一个数字频道，第三次级频道是电缆广播的一个模拟频道。这样，当观众发出一个频道增加的命令时，该 CPU 发送广播地址信息给地面调谐器/解调器 240 以调谐，并且由数字处理装置 265 恢复出相应的数字信号。响应另一个频道增加的命令时，该 CPU 发送相关广播地址信息给卫星调谐器/解调器 250 用于调谐，并且由数字处理装置 265 恢复出相应的数字信号。响应又一个频道增加的命令时，该 CPU 发送相关广播地址信息给电缆调谐器/解调器 230 用于调谐，并且由模拟处理装置 260 恢复出相应的模拟信号。此外，还有一种在不同传输途径传输的每个广播信号的综合，它是以不间断的方式传给用户的。

现在我们讨论依据本发明的频道组的实施细节。前面提到的表 2 是一个虚拟表图，这是因为它把一种虚拟频道标示符诸如一种频道号码与一种特别的节目播放业务提供商的信号联系在一起了。下表 3 将定义一种用于虚拟频道记录的规则。表 3 仅表示了一个需要记录的第一部分。该规则是和先进电视系统委员会（ ATSC ）的标准一致的，该标准是在先进电视系统委员会于 1996 年 1 月 3 日发表的文件 A/56，题目是“用于数字电视的系统信息-ATSC 标准”中描述的，该规则的第一栏是规则的组成部分，第二栏以比特的形式给出规则的组成部分的长度，第三栏标识该规则类型。这些类型是“ bslbf ”型（剩余位串一最高位优选）和 U im bsf 型（无符号整数最高有效位优先）

所有的那些属于一个共同组的成员的频道是以相同虚拟频道信息出现的。那就是说，一条虚拟频道信息是该全部频道图的一个部分的一个独立的定义。一条虚拟频道信息可以定义多个频道组。表 3 示出了在虚拟频道构成中的一个组-成员标记的规则位置。

依照本发明，附加在该规则的该组-成员标志是一个一比特的标志，它提供了一个频道分组机制。特别在于，该组-成员标记是一个布尔标记，当设置时，指示由虚拟-频道（ ）记录定义的虚拟频道是一个组的一部分。当该标志是空白的，表明该频道或者是一个组的初始频道或者不属于该组的

频道。正如讨论的一样，一个初始频道的作用是一个初始位置，允许观众从这个频道开始顺次观看该组的那些频道。当在一个虚拟频道信息（ V irtualchannelm essage ）出现一个或更多表明组-成员（ group-m em ber ）的虚拟频道（ ）记录（ virtual-channels records ）时，该组的初始频道就立即放在该组成员之前。

表 3

	比特	说明
广播-虚拟-频道（） {		
组-成员	1	bslbf{不是，是}
保留	3	bslbf 保留
虚拟-频道-号	12	U im sbf 范围 0-4095
申请-虚拟-频道	1	bslbf{不是，是}
...}		

以表 2 中的 A B C 组为例， 10 频道是初始频道，频道 111-113 是次级频道，对包括 10 频道在内的这部分图进行定义的相应的虚拟频道信息，将按下列所示顺序构成:

（ 1 ）其它频道定义 （任选）；

（ 2 ）虚拟频道 10 （组-成员=0 ）；

（ 3 ）虚拟频道 111 （组-成员=1 ）；

（ 4 ）虚拟频道 112 （组-成员=1 ）；

（ 5 ）虚拟频道 113 （组-成员=1 ）；

（ 6 ）虚拟频道 11 （组-成员=0 ）；

当带有组-成员标记的虚拟频道出现在虚拟信息频道中时，可以以频道号的增加顺序来定义它。这种规定可以避免出现以下模棱两可的现象，即当发出一个增加频道的命令时，是引导观众收看下面最高的虚拟频道号还是收看定义中的下一个组成员频道。当用户发出一个频道下降的命令的时候，可以按照与频道上升命令相反的顺序选择频道。参照表 2 ，下面频道排序是个例证: 11 ， 113 ， 112 ， 111 ， 10 ， 9 以此类推。

按上述定义该组-成员标志的方法，那些不支持该特性的解码器是不受影响的。这样对所有用户来说可以保持信号的兼容性。此外，这种改变对本领域的技术人员来说是明显的，只要他们正确地忽略保留的领域。一个

确实支持该组成员标记的接收机可以提供给用户一个可选的导视的新方法。

针对卫星设备，本发明提供一种简单易做的方式来确定频道号，从而确保频道号的增长不超出分配的空间（例如，带宽）。举个例子，可以把节目播放业务供应商 HBO 已知为频道 100，而且任何数量的附加 HBO 频道都可以与 100 频道有关系。

因此，本发明提供这样一种方法和装置，即允许观众使用一个手持遥控器或类似的装置上的“频道增加”或“频道减少”键，可以容易地导引到节目，这些节目是依照一个公共业务供应商或其它分组规则而进行分组的。该系统对来自一个或更多传输途径的节目播放进行综合，从而允许观众依次选择那些分组的频道，而不用考虑广播信号，传输途径，频谱、传输流和/或传输该频道的 PID 。此外，该系统允许用一个公用频道标识符，诸如一个频道号，来对这些分组频道进行命名，因而允许一个电视台保留一个有关该频道号的标识。

本发明与任何形式的可实现的节目播放业务相兼容，它们包括电视，服务信息诸如：原料价格、天气数据和可由包括游戏的软件执行的音频/视频节目和其它节目。

尽管已经用了许多实施例，对本发明进行阐述，但是，那些本专业技术人员会发现，不超出本发明权利要求书所定义的范围，就可以做出许多变更和修改。

说 明 书 附 图

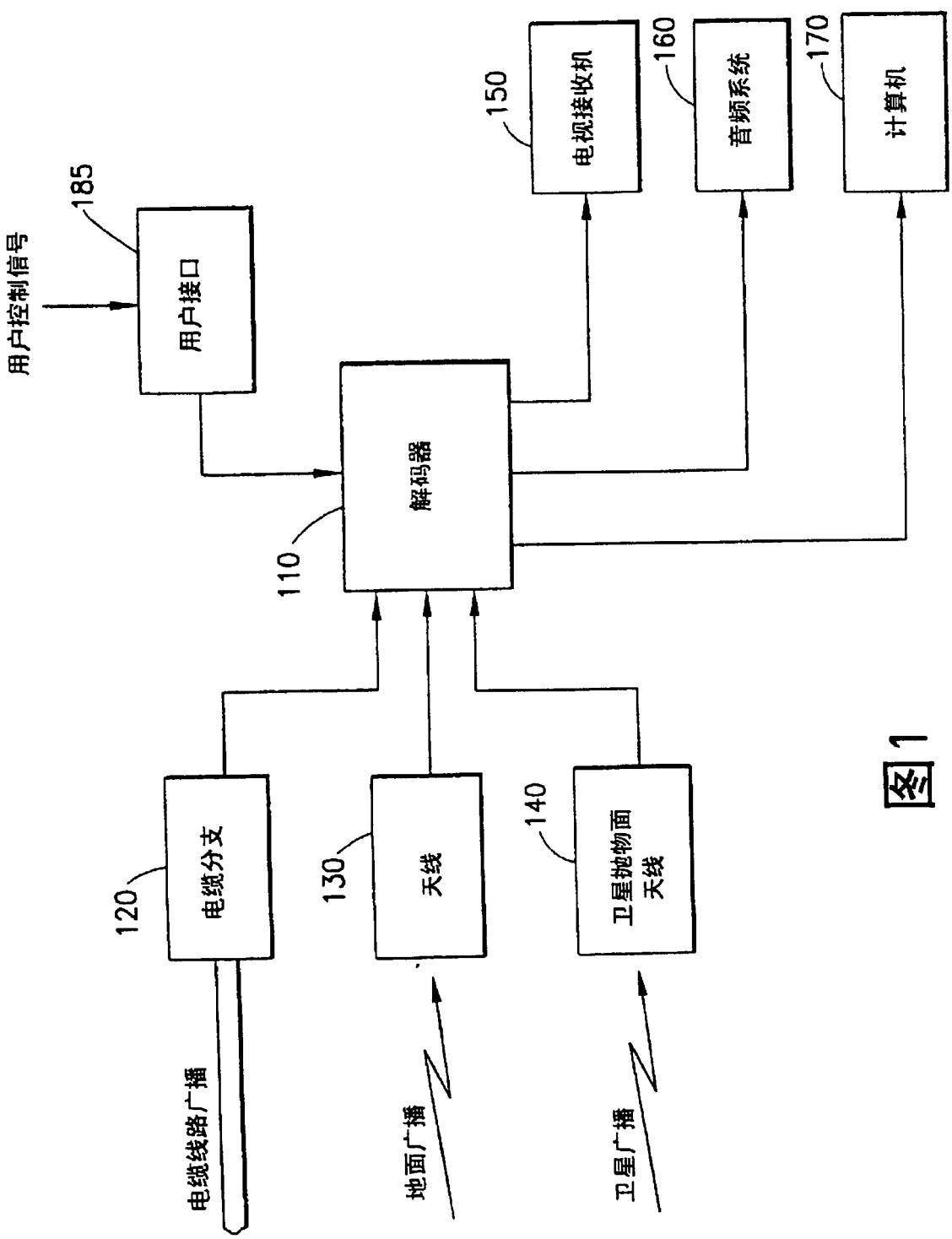

用户控制信号
185
用户接口
110
解码器
150
电视接收机
160
音频系统
170
计算机
120
电缆分支
130
天线
140
卫星抛物面天线
电缆线路广播
地面广播
卫星广播

图 1

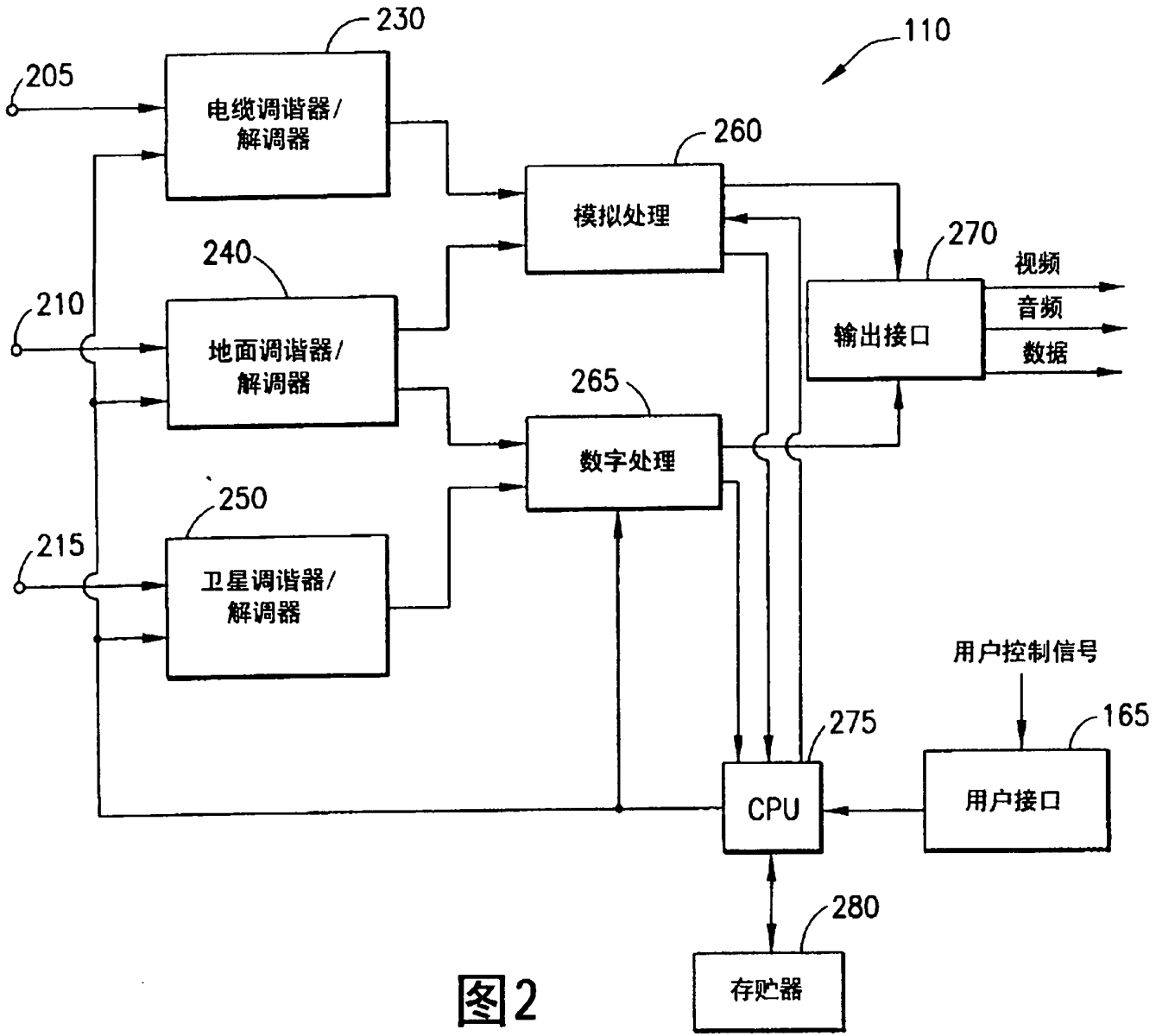

110
205
电缆调谐器/
解调器
230
210
地面调谐器/
解调器
240
215
卫星调谐器/
解调器
250
模拟处理
260
数字处理
265
输出接口
270
视频
音频
数据
用户控制信号
165
用户接口
CPU
275
存贮器
280

图2

RCA 89550 **China**

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[19] The Patent Office of the Peoples Republic of China

[12] The legal specifications of the

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[22] Application date: 18.12.1997

[30] Right of priority

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Authorized representative: Han Hong

Climes - 9 pages,

Specification - 26 pages, Attached figures – 2 pages

[54] Invention denomination:

Navigating the television channels by means of grouping

[57] SUMMARY

A television viewer is able to easily navigate programs that are grouped according to a common service provider or other grouping criteria by pushing the "Channel Up" or "Channel Down" button on a handheld remote control or the like. The system integrates programming services, which are provided through one or more transmission paths, thereby allowing a viewer to successively select the grouped channels regardless of the broadcast signal, transmission path, frequency spectrum, transport stream and / or PID in which the channel is carried.

Claims

1. A method for grouping plurality of broadcast programming services that are provided in corresponding channels, including the steps of grouping the first plurality of mentioned channels in the first channel group according to the desired first grouping criteria; mentioned first channel group including a primary channel, and at least one secondary channel; a user can successively select the programming services corresponding to the mentioned first channel group according to a user control signal.

2. The method according to the claim 1, where the mentioned primary channel is associated with a programming service carried in a primary broadcast signal; mentioned at least one secondary channel is associated with a programming service carried in at least one secondary broadcast signal; and mentioned primary and secondary broadcast signals are provided over respective different transmission paths.

3. The method according to the claim 2, where the path select data is provided with mentioned broadcast programming services for identifying transmission paths.

4. The method according to one of the anterior claims, where mentioned primary channel carries its associated programming service as an analog signal, and mentioned at least one secondary

channel carries its associated programming service as a digital signal.

5. The method according to the claim 1 to 3, where mentioned primary channel carries its associated programming service as a digital signal, and mentioned at least one secondary channel carries its associated programming service as a digital signal.
6. The method according to one of the anterior claims, which includs the further step of providing a virtual channel record that associates mentioned primary channel with a broadcast address of mentioned at least one secondary channel.

7. The method according to the claim 6, where mentioned primary channel is a currently selected channel; and mentioned user control signal is a channel increment command; mentioned method including the further steps of using mentioned virtual channel record to select a broadcast address of the at least one secondary channel, in response to mentioned channel increment command and
processing the selected secondary channel programming service for communication to the user; allowing the user to successively select mentioned primary channel and mentioned selected secondary channel without selecting channels which are not part of mentioned first channel group.

8. The method according to the claim 7, where in response to mentioned channel increment command, the user can successively select mentioned primary channel and all of the secondary channels of the first channel group without selecting channels which are not part of mentioned first channel group.

9. The method according to the claim 6, where a currently selected channel is one of the secondary channels of the first channel group and mentioned user control signal is a channel decrement command; mentioned method including the further steps of using mentioned virtual channel record to select a broadcast address of mentioned primary channel, in response to mentioned channel decrement command; and processing mentioned primary channel programming service for communication to the user; allowing the user to successively select mentioned selected secondary channel and mentioned primary channel without selecting channels that are not part of mentioned first channel group.

10. The method according to the claim 9, where in response to mentioned channel decrement command, the user can successively select all of the secondary channels of the first channel group and mentioned primary channel without selecting channels that are not part of mentioned first channel group.

11. The method according to the one of the anterior claims, including the further steps of grouping the second plurality of mentioned channels in the second channel group according to the desired second grouping criteria; mentioned second channel group including a primary channel and at least one secondary channel; where mentioned channels of mentioned second channel group are not all the same as mentioned channels of mentioned first channel group; and a user can successively select the

programming services corresponding to mentioned second channel group according to a user control signal.

12. The method according to the one of the anterior claims, where mentioned first grouping criteria is determined according to data carried with mentioned broadcast programming services.
13. A decoder for grouping plurality of broadcast programming services that are provided in corresponding channels, including grouping means for grouping a first plurality of mentioned channels in a first channel group according to a desired first grouping criteria; mentioned first channel group including a primary channel and at least one secondary channel; and a user interface for allowing a user to successively select the programming services corresponding to mentioned first channel group according to a user control signal.

14. The decoder according to the claim 13, where mentioned primary channel is associated with a programming service carried in a primary broadcast signal; mentioned at least one secondary channel is associated with a programming service carried in at least one secondary broadcast signal; and mentioned primary and secondary broadcast signals are provided over respective different transmission paths.

15. The decoder according to the claim 14, where path select data is provided with mentioned broadcast programming services for identifying transmission paths.

16. The decoder according to the one of claims 13 to 15, where mentioned primary channel carries its associated programming service as an analog signal, and mentioned at least one secondary channel carries its associated programming service as a digital signal.

17. The decoder according to the one of claims 13 to 15, where mentioned primary channel carries its associated programming service as a digital signal, and mentioned at least one secondary channel carries its associated programming service as a digital signal.

18. The decoder according to the one of claims 13 to 17, further including a memory for storing a virtual channel record that associates mentioned primary channel with a broadcast address of mentioned at least one secondary channel.

19. The decoder according to the claim 18, where mentioned primary channel is a currently selected channel; and mentioned user control signal is a channel increment command; mentioned decoder further including selecting means that uses mentioned virtual channel record to select a broadcast address of the at least one secondary channel, in response to mentioned channel increment command; and
a processor responsive to mentioned selecting means for processing the selected secondary channel programming service for communication to the user; allowing the user to successively select mentioned primary channel and the selected secondary channel without selecting channels which are not part of mentioned first channel group.

20.The decoder according to the claim 19, where mentioned

selecting means is responsive to mentioned channel increment command for allowing the user to successively select mentioned primary channel and all of the secondary channels of mentioned first channel group without selecting channels which are not part of mentioned first channel group.

21.The decoder according to the claim 18, where one of the secondary channels is a currently selected channel; and mentioned user control signal is a channel decrement command; mentioned decoder further including selecting means that uses mentioned virtual channel record to select a broadcast address of mentioned primary channel, in response to mentioned channel decrement command; and
a processor responsive to mentioned selecting means for processing mentioned primary channel programming service for communication to the user; allowing the user to successively select mentioned selected secondary channel and mentioned primary channel without selecting channels that are not part of mentioned first channel group.

22.The decoder according to the claim 21, where mentioned selecting means is responsive to mentioned channel decrement command for allowing the user to successively select all of the secondary channels of mentioned first channel group and mentioned primary channel without selecting channels that are not part of mentioned first channel group.

23.The decoder according to the one of claims 13 to 22, further including means for grouping a second plurality of mentioned channels in a second channel group according to a desired second

grouping criteria; mentioned second channel group including a primary channel and at least one secondary channel; a user interface for allowing a user to successively select the programming services corresponding to mentioned second channel group according to a user control command; where mentioned channels of mentioned second channel group are not all the same as mentioned channels of mentioned first channel group.

24. The decoder according to the one of claims 13 to 23, where mentioned first grouping criteria is determined according to data carried with mentioned broadcast programming services.

25. The method according to the one of claims 1 to 12, including the further step of
providing respective multipart channel designators for mentioned primary channel and mentioned at least one secondary channel, mentioned designators including a first part which identifies mentioned primary channel and mentioned at least one secondary channel in mentioned first channel group, and it also includes a second part that distinguishes mentioned primary channel and mentioned at least one secondary channel from one another.

26. The decoder according to the one of claims 13 to 24, where mentioned user interface provides respective multipart channel designators for mentioned primary channel and mentioned at least one secondary channel, mentioned designators including a first part which identifies mentioned primary channel and mentioned at least one secondary channel in mentioned first channel group, and it also includes a second part that distinguishes mentioned primary channel and mentioned at least one secondary channel from one another.

Specification

Navigating the television channels by means of grouping

The present invention relates to an apparatus and method for grouping a number of television channels according to a grouping criterion. This invention is particularly suitable for grouping channels that originate from a common programming service provider such as a television network, and can be used to integrate programming services that are provided through different broadcast signals in different transmission paths.
Currently, there has been a rapid increase in the number of available television channels due to the arrival of digital television transmission schemes such as MPEG2 and digicipher TM II. A digital television signal can be compressed to fit into a much narrow frequency spectrum than a conventional analog signal. In fact with proposed schemes about ten or more standard definition television (SDTV) channels or two high definition television (HDTV) channels can fit into the 6 MHz bandwidth that conventionally carries only one analog television channel. Accordingly, there has been significant interest in providing a hybrid communication scheme where some of the channel allocations are used to provide digital television signals, while the remaining allocations carry analog television signals. Hybrid scheme is expected to provide a transition to an all digital system by allowing broadcasters to continue transmitting their conventional analog television channel while concurrently transmitting one or more new digital channels.

Currently, frequency allocations for terrestrial broadcast

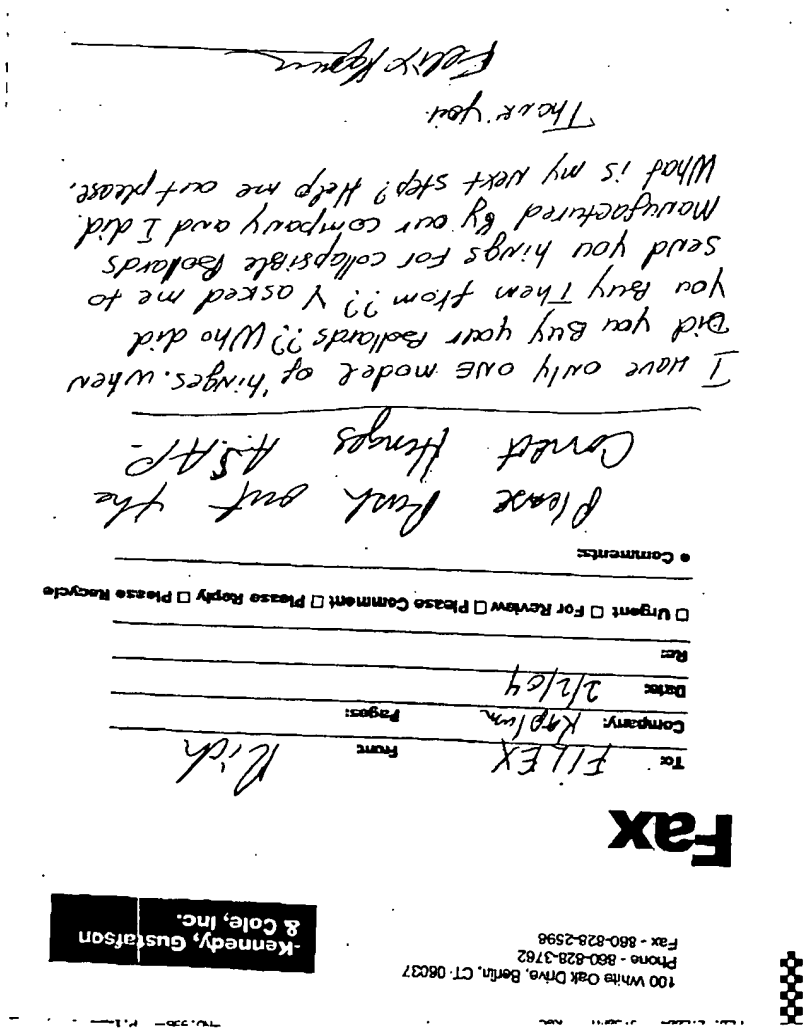
* * * Transmission Result Report(MemoryTX) (Feb. 2. 2004 3:22PM) * * *

1) KAPLUN TOOL AND DIE INC
2)

Date/Time: Feb. 2. 2004 3:09PM

File No.	Mode	Destination	Pg(s)	Result	Page Not Sent
6273	Memory TX	18608283762	P. 1	E-3) 3)	P.1

Reason for error
E.1) Hang up or line fail
E.2) Busy
E.3) No answer
E.4) No facsimile connection



television in the United States range from 54 to 806 MHz, with channels that are each 6 MHz in width. In accordance with regulations of the government, from the Federal Communications Commission (FCC) in the United States, the channels are numbered successively from two to sixty-nine. For example, channel 2 corresponds to a frequency band of 54-60 MHz, and channel 3 corresponds to a frequency band of 60-66 MHz. However, with the large increase in television channels and available programming, there is a need to organize the programs to meet the needs of viewers and programming service providers. In addition, programming service providers wish to maintain a strong brand identity (with respect to its broadcast channel number) even when one service provider offers several different programming choices on different channels, for instance, the programming service provider Home Box Office TM (HBO) has different channels that are identified by the designations HBO, HBO-2, HBO-3. Moreover, nationwide and regional programming service providers wish to maintain a strong association with local affiliates that may provide programming such as local news, sports, features and others. For instance, a national network broadcaster such as the National Broadcasting Company TM (NBC) has numerous local affiliate stations. Many of the local affiliates have a strong brand identity in the channel number corresponding to their allocated frequency band that they would like to maintain and make ("Channel 2 News"). Similarly, viewers wish to have a simple and understandable way of selecting from the available programming services, even when channels are being added or dropped, or the channel assignments of existing programming services are rearranged. In particular, it would be convenient for viewers to have the ability to select between the channels offered by a common service provider by

operating a handheld remote control or the like with "Channel Up" and "Channel Down" buttons.

With existing television systems, channels that are associated with a common programming service provider, cannot be easily accessed with the channel up or channel down function since the associated channels are not usually contiguous. For example, when channels 2 and 20 are associated, viewer would have to push the channel up button and continue to push it for 18 times to move from channel 2 to channel 20. This is time-consuming and inconvenient. Moreover, although the viewer may select the method of entering the desired channel number directly using the numeric keypad of the remote control, this requires the viewer to know the channel numbers of the grouped channels. Moreover, the programming service provider may lose the viewer, because, the viewer while successively selecting a channel may occasionally notice that some channels are more interesting than the channel he initial was going to select offered by that programming service provider. Of course, the programming service provider has a strong interest in maintaining of its connections with viewers in order to set profitable advertising rates.

Grouped television programs may be provided through different broadcast signals that are provided over different transmission paths. For example, a television program such as a nationwide network news program may be transmitted through a direct broadcast satellite (DBS) system which is received through a satellite dish at the home of a viewer. However, programming from a local affiliate in a terrestrial broadcast signal cannot be received by the viewer unless he switches the DBS system off and

tunes in the local program using a conventional "Rabbit Ear" antenna or the like. Moreover, additional associated programming may be available only through another transmission path such as a cable television (CATV) distribution system. Furthermore, with other proposed broadcast schemes such as multipoint microwave distribution systems (MMDS), it can be seen that the available options can quickly overwhelm many viewers.

Accordingly, it would be desirable to provide a system that allows a viewer to easily navigate programs that are grouped according to a common service provider or other grouping criteria by pushing the "Channel Up" or "Channel Down" buttons on a handheld remote control. Additionally, it would be desirable to provide a system for integrating programming services that are provided through one or more transmission paths. The system should allow a viewer to successively select the grouped channels regardless of the broadcast signal, transmission path and / or frequency spectrum in which the channel is carried. The system should also allow the grouped channels to be designated by a common channel designator such as a channel number. The present invention provides a system having the above and other advantages.

In correspondence with this invention, an apparatus and method are presented for allowing a viewer to easily navigate programs that are grouped according to a common service provider or other grouping criteria by pushing the "Channel Up" or "Channel Down" button on a handheld remote control or the like. The system integrates programming services that are provided through one or more transmission paths, thereby allowing a viewer to successively select the grouped channels regardless of the

broadcast signal, transmission path, frequency, transport stream and / or PID in which the channel is carried. Moreover, the system allows the grouped channels to be designated by a common channel designator such as a channel number.
In a method for grouping a plurality of broadcast programming services tthat are provided in corresponding channels, the programs of a number of the channels are grouped in a first channel group according to desired first grouping criteria such as a common programming service provider.

Not all channels must be members of a group. In fact, it is expected that there will be a number of non group, independent channels along with the channels that are grouped in accordance with the present invention. Within the first channel group, although it may appear a group, which has a phenomenon of only one channel, but a primary channel and at least one secondary channel will generally be determined,. The primary channel programming service is carried in a corresponding broadcast address that for an analog signal, may determine a frequency spectrum and, for a digital signal, may determine a transport stream including PID information as well as a transport frequency at which the transport stream is provided. Similarly, the secondary channel programming services are carried at corresponding broadcast addresses. The user can successively select the programming services of the first channel group according to a user control signal such as a "Channel Up" or "Channel Down" command from a handheld remote control.

The primary channel programming service may be carried in a primary broadcast signal, while the secondary channel programming services may be carried in a secondary broadcast signal, and the primary and secondary broadcast signals may be

provided separately over different transmission paths. The transmission paths may include a direct broadcast satellite path, a cable distribution path, a terrestrial broadcast path, and a multipoint microwave distribution system path. Moreover, path select data may be added to the broadcast programming services for identifying the transmission paths.

In a particular embodiment, the primary channel programming service is carried as analog signal, and the secondary channel programming services are carried by one or more packed multiplexed digital signals. PID data is used to distinguish the programming services from one another in a packed multiplexed digital transport stream. Alternatively, both the primary and secondary channel programming services may be carried as digital signals, or the primary channel programming service may be digital while some or all of the secondary channels programming services are analog.

"Virtual Channel" record that associates the primary channel with the broadcast addresses in which the secondary channels are carried in the corresponding broadcast signal is stored locally at the decoder. A "Virtual Channel Map" includes a plurality of virtual channel records. The virtual channel map is traversed by a channel up or channel down signals provided by a user.

When the user provides a channel increment command (channel up) and the current channel is the primary channel of the group, the secondary channel programming services are successively

processed (one after another) for communication to the user through a television screen and audio speaker, the present processing process does not relate to the regardless of the broadcast signal or the location within a broadcast signal in which the secondary channel programming services are carried. Similarly, when the user control signal is a channel decrement (channel down) command and the current channel is a secondary channel, the lower secondary channels are successively selected, before returning to either the primary channel or the next non group channel that follows or precedes the primary channel.

Accordingly, the user can successively view the primary and secondary channels while skipping / bypassing any intermediate non group channels.

Any number of channel groups may be provided (movies group, sport group and others) and the groups may include common channels. There may even be groups of channel groups, and so on.

The grouping criteria will generally be determined according to data transmitted with the programming services or provided to a decoder through an alternate route such as a smart card or telephone line. Moreover, a corresponding decoder is also presented.

Fig. 1 is a schematic diagram of a communication system according to the present invention.
Fig. 2 is a schematic diagram of a decoder in according to the present invention.
According to the present invention, a method and apparatus are presented for allowing a viewer to easily navigate television

programs that are grouped according to a common service provider or other grouping criteria by pushing the "Channel Up" or "Channel Down" button on a handheld remote control or the like, thereby allowing a viewer to successively select the grouped channels regardless of the broadcast signal, transmission path and / or broadcast address in which the channel is carried.
Table 1 below shows the circumstances of a conventional grouping of channels that may currently exist. The first column is a "virtual channel designator" that is simply an assigned channel number. The designator is "virtual" since it is arbitrarily assigned. The second column indicates a "programming service provider" that may be the call letters of the television station or other source. The third column indicates the location of related channels. Here virtual channel designators 200-202 correspond to the programming service provider call letters HBO, HBO-2 and HBO-3. respectively. With conventional schemes, the best that can be hoped for is that related channels are assigned to consecutive conventional channel numbers.

Virtual Channel Designator	Programming Service Provider	Description
1	WGN	
2	KTLA	
...		
8	KCST	
9	KUSI	
10	KGTV	

11	KPBS	
...		
199	Weather	
200 201 202	HBO HBO-2 HBO-3	Related channels with consecutive channel numbers
203	CMX	

Table 2 below shows a channel group in according to the present invention. In this example, a first channel group (ABC group) includes channels 10 and 111-113. Additionally, channel 10 is defined as a "primary channel", channels 111-113 are defined as "secondary channels" of the group. The primary channel represents a starting point, from which a number of successive "Channel Up" steps through all channels in the group.

Virtual Channel Designator	Programming Service Provider	Description
1	WGN	
2	KTLA	

...		
8	KCST	
9	KUSI	
10	KGTV	
11	KPBS	
...		
110	WH1	
111 112 113	ABC-1 ABC-2 ABC-3	ABC Group, Secondary Channels
...		
199	Weather	

A decoder that supports the channel group concept of the present invention can allow a viewer to easily move / navigate among the channels of a group. For example, assume that channel 8 is a currently selected channel. Then, as the viewer pushes "Channel Up" (channel increment) button or the like on a handheld remote control or similar device, the following sequence of virtual channels is selected: 9, 10, 111, 112, 113, 11, ... Thus, there is a "Jump" from channel 10 to 111 since the intermediate channels 11 to 110 are bypassed, and a jump from channel 113 to 11 since the intermediate channels 112 to 12 are bypassed. Note that when a primary channel (channel 10) is the current channel and the

viewer provides a channel up command, the next channel that is displayed will be one of the secondary channels (channel 111) of the group to which the primary channel belongs. Moreover, the viewer can switch directly to the other secondary channels until the last secondary channel is reached (channel 113). Thus, the viewer can successively view the channels of the ABC group without viewing non group intermediate channels.

When the last secondary channel of a group is reached and the viewer provides another channel up command, the group is exited and the next virtual channel that follows the primary channel of the group is selected (channel 11). The viewer can then switch between the non grouped channels in a conventional manner successively from channel 11 to 12, 13 and so on.

If a currently selected channel is in a group and the viewer makes a "Channel Down" (channel decrement) command, the viewer will successively switch between the secondary channels of the group in the opposite direction, and then jump to the non group channel that is the next higher channel number following the primary channel. For instance, if channel 113 is the currently selected channel, the sequence may be: 112, 111, 11.

Alternatively, the sequence could return the viewer to the primary channel of the group, in the sequence: 112, 111, 10, and thereafter to the channel that immediately precedes the primary channel of the group channel 9. Alternatively, when the currently selected channel is any secondary channel of a group and a channel down command is issued, the next selected channel may be the primary channel even if intermediate secondary channels of the group are present. This is exemplified by the channel sequence: 113, 10.

Moreover, although various modes are possible, it may be preferable when navigating a group for the channel sequence in the down direction to be the exact inverse of the channel sequence in the up direction. This is believed to be the mode that would be most convenient and easily understood by most viewers.

Additionally, other commands besides the channel up or channel down may be used to invoke a particular navigation sequence. For instance, a "home" button or the like on a remote control or similar interface device may be used to immediately select a primary channel of a current group or another designated channel. Alternatively, a viewer may select a particular command mode. For example, in a first mode, a channel down command will immediately select a primary channel when the current channel is a secondary channel. In a second mode, by channel down command will select intermediate secondary channels, if there are any intermediate channels of the secondary channels, before returning to the primary channel. In a third mode, a channel down command will select intermediate secondary channels, and will continue to select non grouped channels that are adjacent to the secondary channels rather than returning to the primary channel. This third mode is exemplified by the channel sequence: 10, 111, 110, 109 and so on.

In the example of Table 2, these groups of channels were defined according to a common programming service provider, sponsor or other proprietary entity. However, the groups may be determined according to various criteria such as a programming theme (sports, premium movies, networks, variety, children's programming, news, educational programming, and so on), popularity (group the ten most highly rated programming services

based on Nielson ratings or total viewership in U.S. households), demographic factors (group programming services that are targeted toward families with young children), geography, or virtually any other actually existing factors.

Furthermore, the group concept can be extended to a group having channels that are separated by two or more sets of intermediate (non group) channels. For example, two secondary channels may be separated by one or more non-group channels. Additionally, groups of two or more channel groups may be provided. For example, a viewer may wish to successively view channels belonging to a sports group, then successively view channels belonging to a movies group, and so on. Additionally, in some case, several different instances of programming from one national network that correspond to different time zones may be provided in a group. For instance, a group may include East coast feeds, Mountain states feeds, and West coast feeds of the same network programs. Thus, a viewer could successively view programming services from the same channel but in different time zones.

Moreover, the groups along with the sequencing mode may be determined according to data that is carried with the broadcast programming services, through a separate transmission path such as a telephone line, or installed locally such as through a smart card or user input.

Regardless of the navigating mode or sequence, each channel will have a distinct virtual channel number in the range from 1 to 999, which allows the viewer to directly access a channel by pushing

the number on a numerical keypad of a remote control. Alternatively, the viewer may also use a graphical user interface (GUI) to select channels. Thus, it will be understood that the viewer channel selection process is not limited to hand held remote control devices but may include virtually any apparatus for selecting a channel, including pointing devices such as a mouse, or a keyboard, a touch screen, voice recognition systems, and so on.

Fig. 1 is a schematic diagram of a communication system in accordance with the present invention. Fig. 1 represents how the channel groups of the present invention can be integrated into a decoder system where both digital and analog signals are carried in respective frequency bands of one or more transmitted signals which may be carried in different transmission paths (terrestrial, DBS, CATV, MMDS). Here, three possible different transmission paths are shown. A cable plant broadcast signal is received at a cable drop 120 near a viewer's home. The cable broadcast signal may include analog and/or digital signals, but will be assumed to include only analog signals in the example of the present invention. A terrestrial broadcast signal, which, in a hybrid scheme, may include analog and digital signals in respective frequency bands, is received by an antenna 130 near the viewer's home. Finally, digital signals from a satellite broadcast such as in a DBS system is received by a satellite dish 140 near the viewer's home.

Each of the received signals is provided to a decoder 110 for processing. The decoder also receives an input signal from a user interface 185, which is responsive to a user control signal, which may be a channel up or channel down command signal from a

remote control as discussed previously. The decoder 110 processes one or more of the broadcast signals to provide the requested signal in the form of a video signal to a television receiver 150, an audio signal to an audio system 160 such as a home theater high fidelity system, and / or a data signal to a computer 170. Other outputs may also be provided, for example, when home appliances, security or fire system or the like are integrated with the decoder.

Fig. 2 is a schematic diagram of a decoder in accordance with the present invention. While three or more different broadcast signals may be processed by the decoder 110, processing of only one of the broadcast signals at a given time may be required.

Additionally, the decoder 110 is operable when only one broadcast signal is provided. The decoder 110 receives the cable broadcast signal via a terminal 205 and provides it to a cable tuner / demodulator 230 where a selected programming service signal may be retrieved. The retrieved programming service is processed by an analog processing device 260. The analog processing device 260 provides corresponding video, audio and / or data signals to an output interface 270 wherein these signals are output to appropriate devices.

A terminal 210 receives a terrestrial broadcast signal which includes analog and digital signals in the present example and passes the signal to a terrestrial tuner/demodulator 240. The terrestrial tuner / demodulator 240 retrieves a selected programming service and determines whether it is digital or analog. If the retrieved signal is analog, the signal is provided to the analog processing device 260. It should be understood that

although the analog processing device 260 is shown as processing analog signals from both the cable broadcast and the terrestrial broadcast, this is not to say that each analog signal is identically processed. Different analog transmission schemes and transmission protocols must be created according to the individual broadcast signal. Moreover, note that any combined digital and / or analog signals may exist in the broadcasts.
If the retrieved signal from the terrestrial tuner / demodulator 240 is digital, the signal is provided to the digital processor 265, where video, audio and/or data processing is processed to recover the corresponding information. The digital processor 265 receives broadcast address information from the central processing unit (CPU) 275 for identifying the PIDs in which the selected programming service is carried in the digital signal. Typically, data packets from up to ten or more digital programming services are packed and multiplexed for delivery in a digital transport stream which is provided in an allocated frequency spectrum. The processor 265 processes the appropriate data packets to provide the selected programming service to the output interface 270.
A terminal 215 receives a digital satellite broadcast signal such as from a DBS system and passes the signal to a satellite tuner/demodulator 250. The tuner / demodulator 250 retrieves the selected programming service according to the broadcast address information from the CPU 275 and provides it to the digital processor 265. It should be understood that although the digital processor 265 is shown as processing digital signals from both the terrestrial broadcast and the satellite broadcast, the processing of the digital signals might differ.

The CPU 275 may receive signals from the analog processing device 260 and / or the digital processor 265 that indicate the

transmission path of the signal, and / or provide channel grouping information (virtual channel map or record) signal. For an analog signal, the channel grouping information can be placed into the vertical blanking interval (VBI), for example. For a digital signal, channel grouping signal may be carried in a virtual channel map, which is provided in the transport stream. The CPU 275 also receives a user command which is indicative of a selected channel from the user interface 185 in response to the user control signal. For example, when the user issues a control signal using a hand held infrared transmitter, the user interface 185 will include an infrared receiver. A memory 280 which is associated with the CPU 275 stores the transmission path and channel grouping data and may also maintain a record of user control signals and other relevant information. The CPU also provides a control signal including broadcast address information (frequency and / or PID) to the tuner/demodulators 230, 240 and / or 250, which are used to indicate the selected channel so that the appropriate data can be retrieved.

Note that, on Fig. 2, different conventional processing steps such as demultiplexing, parsing, decryption and the like may be required but are not specifically shown on the figure. These steps are well known in the art nowadays.

In a first specific illustration of the decoder 110 on fig. 2, assume that analog and digital terrestrial broadcast signals are received by the decoder (on terminal 210). Thus, only one broadcast signal tuner / demodulator (unit 240) need be provided. In this case, the other broadcast signal tuner / demodulators (units 230 and 250) need not be provided. For example, referencing Table 2, channel 10 is a local affiliate of ABC, a national programming service

provider, and transmits a television signal through terrestrial broadcast in the frequency band from 192-198 MHz. Assume further that a hybrid terrestrial broadcast scheme is available where digital signals are carried in unused frequency bands or portions of the analog waveform such as the biform example, ABC may transmit the programming services of channels having the call letters ABC-1, ABC-2 and ABC-3 in a packed multiplexed digital signal that is carried in a 6 MHz band. Moreover, the band from 506-512 MHz may be unused in the area of the local affiliate, this band has been designated as channel 20 by the FCC. Moreover, each of the channels ABC-1, ABC-2 and ABC-3 may be carried in separate bands in respective packed multiplexed digital signals.

For marketing purposes, the national programming service provider may wish to have the three digital channels ABC-1, ABC-2 and ABC-3 identified with the original local analog channel, analog channel 10. The present invention makes this possible regardless of the transport stream and / or PIDs in which the three digital signals are carried. In particular, data may be transmitted with the analog channel 10 signal, for example, in the VBI, that identifies channel 10 as a primary channel of the ABC channel group. Similarly, data is provided to the channels ABC-1, ABC-2 and ABC-3, that identifies them as secondary channels of the ABC channel group. Moreover, the channel grouping information can be carried with the analog channel 10 signal, in an unused channel allocation, or through any other available means.

Assume a user provides a control signal to select channel 10. The CPU will provide the appropriate broadcast address information to the terrestrial tuner / demodulator 240 to recover the analog signal in the frequency band 192-198 MHz. The analog processing device 260 will subsequently process the analog signal to provide it in a form suitable for display on a television. Now assume the user wished to successively view the secondary channels in the ABC group. In accordance with the given invention, the user can provide a channel up control signal to the user interface 165. The CPU 275 will receive a corresponding control signal from the interface 165 and access data stored in the memory 280 to determine the appropriate broadcast address information (frequency, PID and / or other required parameter) of the first secondary channel in the group (channel ABC-1).
In this example, there is only one broadcast signal, namely the terrestrial broadcast signal, received through terminal 210, it provides with the corresponding frequency spectrum and PID in which ABC-1 is carried.

The CPU provides the appropriate broadcast address information to the terrestrial tuner / demodulator 240 and digital processor 265 to retrieve the digital data in the 506-512 MHz frequency band. As mentioned before, when data from two or more digital channels are provided in a common transport stream such as in a packet multiplex scheme, the broadcast address information provided by the memory includes a PID or other information that is used to distinguish one programming service from another.

The appropriate digital data will be retrieved and provided to the digital processor 265. A corresponding signal that is suitable for display on a television, will then be provided to the output interface 270. Thus, by simply providing a channel up command,

the viewer can immediately switch from channel 10 in the 192-198 MHz band to channel ABC-1 in the 506-512 MHz band. The intermediate channels in the band from 198-506 MHz, and the non group channels that may be carried in the transport stream in the 506-512 MHz band, are bypassed. Moreover, if the viewer continue to provide a channel up command after channel ABC-1 has been selected, then he can switch directly to channels ABC-2 and ABC-3 in the transport stream in the 506-512 MHz band, and then to channel 11 in the 198-204 MHz band.

Note that channels ABC-1, ABC-2 and ABC-3 have been referred to in terms of their call letters and not by a numerical channel designator. In order to reinforce in the mind of a viewer the impression that particular channels are part of a group of a common service provider, for instance, it may be desirable to use the same channel designator of the primary channel, or a variation thereof, for the secondary channels.

For instance, it may be desirable to provide a display on the decoder or the television, for instance, that informs the viewer that channels ABC-1, ABC-2 and ABC-3 are designated, respectively, "10.1", "10.2" and "10.3', or, "10-A", "10-B" and "10-C," or the like. In this way, the viewer is reminded that channels ABC-1, ABC-2 and ABC-3 are related to channel 10, the viewer's well-known local affiliate. The secondary channels may be thought of as being "broadcasted inside" the familiar channel 10, or somehow right next to channel 10 in the broadcast signal.

Moreover, even if channel 10 (local KGTV) moves to a different frequency spectrum, transport stream and / or PID, either as an

analog or digital signal, the channel 10 group, or family of stations can still be maintained. In particular, the KGTV signal can be assigned to a virtual channel 10 to maintain a continuing identity with viewers. The designation "10" is "virtual" since it does not necessarily correspond to the FCC channel designation scheme or any particular frequency spectrum or PID location. In a second specific illustration of the decoder 110 shown in the fig. 2, assume that three broadcast signals are received by the decoder 10 through three different transmission paths, a cable broadcast including analog channels, a hybrid terrestrial broadcast including both analog and digital channels, and a satellite broadcast including digital channels. In accordance with the user control signal, a desired channel is selected.

The CPU 275 accesses the memory 280 to determine broadcast address information that corresponds to the selected channel. The corresponding tuner demodulator, e.g., tuner/demodulator 230, 240 or 250 is activated to retrieve the desired signal along with the device 265 for a digital signal, or the device 260 for an analog signal.

For example, assume a primary channel that is an analog channel in the terrestrial broadcast signal processed at tuner/demodulator 240 is the currently selected channel, that a first secondary channel is a digital signal in the terrestrial broadcast, that a second secondary channel is a digital signal in the satellite broadcast, and that a third secondary channel is an analog signal in the cable broadcast.

Thus, when the user provides a channel up command, the CPU will send broadcast address information to the terrestrial tuner / demodulator 240 to tune and recover the corresponding digital

signal for processing by the digital processor 265. In response to another channel up command, the CPU will send corresponding broadcast address information to the satellite tuner / demodulator 250 to tune and recover the corresponding digital signal for processing by the digital processor 265. In response to yet another channel up command, the CPU will send corresponding broadcast address information to the cable tuner / demodulator 230 to tune and recover the corresponding analog signal for processing by the analog processing device 260. Moreover, there is an integration of each of the broadcast signals in the different transmission paths in a manner that is seamless to the user.

Implementation details of the channel group according to the present invention will now be discussed. Table 2 mentioned above is a virtual table map since it relates a virtual channel designator such as a channel number with a particular programming service provider's signal. A syntax for a virtual channel record is defined in Table 3 below. Table 3 shows only the first part of a required record. The syntax is compatible with standards of the Advanced Television Systems Committee (ATSC) described in "System Information for Digital Television - ATSC Standard," Document A / 56, January 3, 1996, Advanced Television Systems Committee, the first column of the syntax contains the syntax element, the second column gives the length of the syntax elements in bits, and the third column identifies the syntax type. The types are "BSLBF" (bit string left most bit first) and UIMBSF (unsigned integer most significant bit first).

All channels that are members of a common group appear with the same virtual channel message. That is, a virtual channel message is a self-contained definition of one part of the full

channel map. One virtual channel message may define multiple channel groups. Table 3 shows the syntactic location of a group member flag in the virtual channel structure.

The group member flag that is added to the syntax according to the present invention, is a one bit flag that provides a channel grouping mechanism. Specifically, the group member flag is a boolean flag that, when set, indicates that the virtual channel that is defined by the virtual channel record is part of a group. When the flag is clear, the channel is either not part of a group, or is a primary channel of a group. As discussed, a primary channel acts as a starting point for allowing a viewer to successively view those channels of a group beginning from this channel. When one or more virtual channel records flagged group member appears in a virtual channel message, the group member is immediately preceded by the primary channel of the group.
EMI30.1

	bite	description
Broadcast_virtual_channel () {		
group_member	1	bslbf {no, yes}
Reserve	3	bslbf reserve
Virtual_channel_number	12	uimsbf bound 0-4095
Application_virtual_channel	1	bslbf {no, yes}
...}		

For example, with the ABC group of Table 2, where channel 10 is the primary channel channels 111-113 are the secondary channels, the corresponding virtual channel message that defines this part of the map that includes channel 10 would be constructed as follows in the shown order:

1) Other channel definitions (optional);
2) virtual channel 10 (group_member=0);
3) virtual channel 111 (group_member=1);
4) virtual channel 112 (group_member=1);
5) virtual channel 113 (group_member=1);
6) virtual channel 11 (group_member=0).

Virtual channels with the group member attribute can be defined in increasing order of channel number as they appear in the

virtual message channel. This stipulation will avoid ambiguity as to whether a channel up command takes the user to the next highest virtual channel number or to the next group member channel in the definition. When the user provides a channel down command, the channels may be selected in an order that is the reverse of the channel up order. Referencing Table 2, the following channel sequence is an exemplification: 11, 113, 112, 111, 10, 9 and so on.

According to the defined above method of the group member flag the decoders that do not support the feature are unaffected. Accordingly, signal compatibility can be maintained for all users. Moreover, the change is transparent to fielded units as long as they correctly ignore reserved fields. A receiver that does support the group member flag will be able to offer the user an optional, new method of navigation.

For satellite devices, the present invention provides a simplified way to assign channel numbers to ensure that growth in the number of channels does not exceed the allocated space (bandwidth). For example, the programming service provider HBO could be known as channel 100, and any number of additional HBO channels could be associated with channel 100. Accordingly, it can be seen that the present invention provides an apparatus and method for allowing a viewer to easily navigate programs that are grouped according to a common service provider or other grouping criteria by pushing the "Channel Up" or "Channel Down" button on a handheld remote control or the like.

The system integrates programming services that are provided through one or more transmission paths, allowing a viewer to successively select the grouped channels regardless of the broadcast signal, transmission path, frequency spectrum, transport stream and / or PID in which the channel is carried. Moreover, the system allows the grouped channels to be designated by a common channel designator such as a channel number to allow a television station to maintain an identity that is related to the channel number.

The invention is compatible with any actually existing type of programming service, including television, information services such as stock prices and weather data, and audio / video programming which can be implemented in software including games and other programs.

Although this invention has been described in connection with various specific embodiments, those skilled in the art may notice that various adaptations and modifications may be made without departing from the spirit and scope of the invention as set on in the claims.

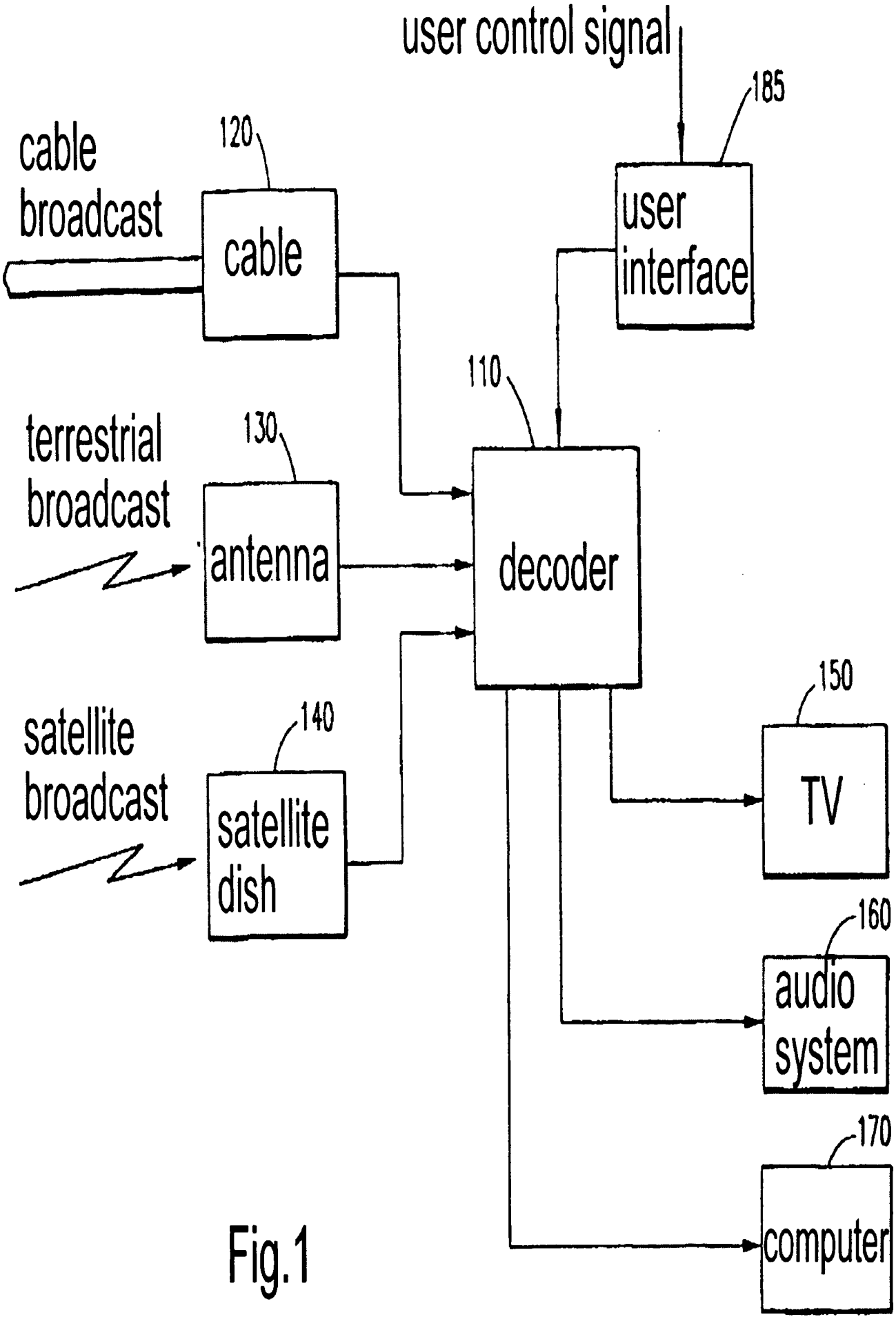

user control signal
185
user interface
cable broadcast
120
cable
110
terrestrial broadcast
130
antenna
decoder
satellite broadcast
140
satellite dish
150
TV
160
audio system
170
computer

Fig.1